We claim:

1. A method of designing a primary geometry for a powder pressing application, comprising:

generating a primary geometry of a component to be formed by powder pressing wherein the primary geometry is developed using a combination of axisymmetric geometric shapes and transition radii to simulate said primary geometry, said axisymmetric geometric shapes having variable dimensions;

developing a finite element mesh representing said primary geometry;

assigning material properties to said axisymmetric geometric shapes representing said component;

defining pressing boundary conditions;

defining a powder and powder material properties to be pressed in said primary geometry;

calculating deformation characteristics of said powder and primary geometry using a deformation, nonlinear, quasi-static finite element code; and

evaluating said deformation characteristics to determine the acceptability of said primary geometry.

2. The method of claim 1 further comprising the step of optionally modifying said primary geometry, said material properties of said component, and said pressing boundary conditions to form a component geometry for use in powder pressing.
3. The method of claim 1 wherein said axisymmetric geometric shapes are selected from cylinders, cones, toroids, spheres, parallelpipeds, ellipsoids, and polyhedrons.
4. The method of claim 1 wherein said powder is selected from a ceramic powder, a metal powder, a pharmaceutical powder, a plastic powder and mixtures thereof.
5. The method of claim 1 wherein said development of the finite element mesh and said calculation of the deformation characteristics are performed in less than approximately 60 minutes.

6. The method of claim 5 wherein said development of the finite element mesh and said calculation of the deformation characteristics are performed on a personal computer.
7. The method of claim 1 wherein said finite element mesh represents a two-dimensional primary geometry.
8. The method of claim 1 wherein said finite element mesh represents a three-dimensional primary geometry.
9. The method of claim 1 wherein the primary geometry is the design of a component for use in mechanical pressing applications.
10. The method of claim 1 wherein the primary geometry is the design a forming die.
11. The method of claim 1 wherein the pressing process is designed to produce the primary geometry.
12. The method of claim 1 wherein the primary geometry is generated with the aid of a graphical user interface on a computer.
13. The method of claim 1 wherein the step of generating the primary geometry uses said axisymmetric geometric shapes selected from a menu of axisymmetric geometric shapes interactively selected with the aid of a graphical user interface on a computer.
14. The method of claim 1 wherein the step of assigning the material properties to said axisymmetric geometric shapes is performed with the aid of a graphical user interface on a computer,
15. The method of claim 1 wherein the primary geometry is generated with the aid of a graphical user interface on a computer using physical dimensions from a finished part.
16. The method of claim 1 wherein the primary geometry is generated with the aid of a graphical user interface on a computer whereby the geometric shapes used to construct the primary geometry are selected from a display menu on a computer screen.

17. A method of designing a die geometry for a powder pressing application, comprising:

generating a die geometry of a component to be formed by powder pressing wherein the die geometry is developed using a combination of axisymmetric geometric shapes, transition radii, and transition spaces to simulate said primary geometry, said axisymmetric geometric shapes having variable dimensions, said axisymmetric geometric shapes selected from cylinders, cones, toroids, spheres, parallelpipeds, ellipsoids, and polyhedrons;

developing a finite element mesh representing said die geometry;

assigning material properties to said axisymmetric geometric shapes representing said component;

defining pressing boundary conditions;

defining a powder and powder material properties to be pressed in said primary geometry, said powder selected from a ceramic powder, a metal powder, a pharmaceutical powder, a plastic powder and mixtures thereof;

calculating deformation characteristics of said powder and die geometry using a deformation, nonlinear, quasi-static finite element code; and

evaluating said deformation characteristics to determine the acceptability of said die geometry.

18. The method of claim 17 performed on a computer in less than approximately 60 minutes.